35 U.S.C. 102(b) -- U.S. Patent No. 6,013,591 to Ying *et al.*

A proper claim rejection under 35 U.S.C. §102(b) requires that each and every element of the claimed invention be shown or taught in the cited reference. It does not appear that this requirement has been met with respect to the proposed rejection of claim 21.

Ying *et al.* discloses a composition prepared from a nanoscale material or a combination of nanoscale materials. Ying *et al.* teaches a preferred crystal size that approximates that of bone, *i.e.*, 20-30 nm. [Col. 10, lines 53 *et seq.*] When more than one nanoscale material is present, Ying *et al.* suggests that "it is typically best if the various components are of approximately similar particle size." [Col. 9. lines 41-42.] Nothing in Ying *et al.* teaches or suggests a composition prepared from both a nanoscale material and coarse particles of that same material.

Ying *et al.* teaches preparation of nanoscale compositions in disc or pellet form. Applicants find nothing in Ying *et al.* that teaches or suggests a composition or product having a densified film approximately 10-80 microns thick.

Applicants also find nothing in Ying *et al.* that suggests that any of the Ying *et al.* nanoscale compositions is capable of forming a densified ceramic electrolyte material coating. It is known to persons of ordinary skill in the relevant art that compositions of nanoscale particles undergo tremendous shrinkage during densification and that such shrinkage typically results in cracks or other defects in the densified material, particularly when the solid electrolyte material is present as a thin film or layer. [*See, e.g.*, Specification, page 6, lines 7-14.] While the shrinkage of the Ying *et al.* compositions may be acceptable in bioceramic applications, applicants respectfully submit that none of them would not result in a satisfactory ceramic

electrolyte coating. The claimed product, which includes both nanoscale and coarse solid electrolyte precursor materials, provides better resistance to shrinkage compared to compositions comprised solely of nanoscale materials. The reduced shrinkage corresponds to a reduction in defects such that the claimed product can function satisfactorily as a ceramic electrolyte material. The presence of both nanoscale and coarse particles of the solid electrolyte precursor material also reduces defects in the claimed product by providing superior bridging of substrate pores that exceed the size of the constituent particles.

Because Ying *et al.* does not show or teach each and every element of the claimed invention, applicants respectfully request that the claim rejection based thereon be withdrawn.

35 U.S.C. 1029b) -- U.S. Patent No. 5,905,000 to Yadav *et al.*

A proper claim rejection under 35 U.S.C. §102(b) requires that each and every element of the claimed invention be shown or taught in the cited reference. It does not appear that this requirement has been met with respect to the proposed rejection of claims 21 and 38-45.

Yadav *et al.* discloses solid electrolyte materials prepared by pressing a nanoscale material into disc form. Nothing in Yadav *et al.* teaches or suggests a solid electrolyte material prepared from both a nanoscale material and coarse particles of that same material.

With respect to claims 21 and 40-45, applicants find nothing in Yadav *et al.* that teaches or suggests a product having a densified ceramic electrolyte film approximately 10-80 microns thick. The 3-mm discs of Example 1 of Yadav *et al.* each are formed from 0.15 g of nanoscale YSZ particles. By contrast, in Example 4 of the present invention, 0.05 g of spray slurry (including both nanoscale and coarse particles of YSZ) were applied to 2.5 cm x 2.5 cm substrate to form a continuous film approximately 40 microns thick before densification and

approximately 20 microns thick after densification. Similarly, with respect to claims 38 and 39, applicants find nothing in Yadav *et al.* that teaches or suggests a product having a densified ceramic electrolyte film approximately 5-40 microns thick.

Further, applicants submit that none of the Yadav *et al.* solid electrolyte materials is capable of forming a satisfactory densified electrolyte film having a thickness of approximately 5-40 microns. As described above, it is known to persons of ordinary skill in the relevant art that nanoscale materials in pure form undergo tremendous shrinkage during densification and that such shrinkage typically results in cracks or other defects in the densified material, particularly when the solid electrolyte material is present as a thin film or layer. While the Yadav *et al.* compositions may be acceptable ceramic electrolyte materials in other forms, applicants respectfully submit that they would not result in a satisfactory ceramic electrolyte coating of the claimed thickness. The claimed product, which includes both nanoscale and coarse solid electrolyte precursor materials, provides better resistance to shrinkage compared to compositions comprised solely of nanoscale materials. The reduced shrinkage corresponds to a reduction in defects such that the claimed product can function satisfactorily as a ceramic electrolyte material. The presence of both nanoscale and coarse particles of the solid electrolyte precursor material also reduces defects in the claimed product by providing superior bridging of substrate pores that exceed the size of the constituent particles.

Because Yadav *et al.* does not show or teach each and every element of the claimed invention, applicants respectfully request that the claim rejection based thereon be withdrawn.

## CONCLUSION

For the reasons stated above, applicants submit that the claims presented herein are patentable over the cited references. Accordingly, applicants respectfully submit that the application is in condition for allowance and request that a notice of allowance be issued.

Respectfully submitted,

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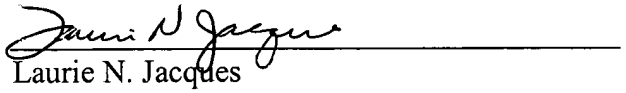
By: 

Laurie N. Jacques
Reg. No. 35,905
PORTER, WRIGHT, MORRIS & ARTHUR LLP
41 South High Street
Columbus, Ohio 43215-6194
Phone: (614) 227-2032